

Avocado Growers can Reduce Soil Nitrate Groundwater Pollution and Increase Yield and Profit

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Project Leader:

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Objectives

1. Test the results of preliminary research suggesting that a single application of urea to the canopy during early bloom will increase yield and net return to the grower over untreated control trees at the 5% level and will significantly increase yield over trees receiving canopy applications of boron.
2. Determine if N applied to the canopy during expansion of the spring flush leaves increases the yield alone and /or in combination with the bloom canopy application of urea.
3. Determine if canopy applications of urea during bloom or during leaf expansion of the spring flush can replace part of the N annually applied to the soil in avocado production.
4. Disseminate the results of this research to avocado growers through talks to growers and publications in grower magazines and the California Avocado Society Yearbook.

Summary

Canopy applications of boron or low-biuret urea were made from 1994 to 1996 during early inflorescence development and/or during leaf expansion of spring flush (May). Unocal PLUS, zero biuret urea, was applied at a rate of 0.3 lb N per tree and Solubor, 20.5% boron, at 1.1oz per tree in 4 gallons of water to give full canopy coverage. In year 1, an "on" year, there were no statistically significant differences in kg fruit per tree as a result of any treatment. The bloom application of low-biuret urea increased the number of large sized fruit, (packinghouse sizes 40 and 36), over all other treatments and the control at $P = 0.06$. The increase in number of larger-size fruit was not due to any reduction in yield. Trees receiving the bloom application of low-biuret urea yielded 416 lbs per tree, the control trees 412 lbs. While not statistically significant even at the 5% level, it is worth noting that the trees receiving both the bloom and May spring flush applications of low-biuret averaged 492 lbs fruit per tree, which was 80 lbs more fruit per tree than the control. Trees receiving only the May spring flush application of low-biuret averaged 24 lbs more fruit per tree than the control. In contrast, the harvest for year 2 represented on an "off" year: compare 140 lbs fruit per control

tree in year two to 412 lbs fruit per control tree for the previous harvest in year one of the experiment. No treatment significantly increased the total fruit yield per tree at the 5% level. Trees receiving boron sprays at bloom produced yields lower than the control trees for both years of the study.

Due to alternate bearing there was no cumulative yield or economic benefits from any of the treatments. The results thus far provide evidence that urea applied to the canopy at bloom and again during the spring flush can increase yields. The results suggest, however, that this treatment should be initiated and/or used only when an orchard is going into an "off" year. This interpretation should be further tested.